

Translation

PATENT COOPERATION TREATY

PCT/EP2003/004899



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 97 063/K	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/004899	International filing date (day/month/year) 10 May 2003 (10.05.2003)	Priority date (day/month/year) 25 July 2002 (25.07.2002)
International Patent Classification (IPC) or national classification and IPC C01B 17/04, B01D 53/86		
Applicant THYSSENKRUPP ENCOKE GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 14 February 2004 (14.02.2004)	Date of completion of this report 17 November 2004 (17.11.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/004899

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
 pages \_\_\_\_\_ 1-7 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_ 1-6 \_\_\_\_\_, filed with the letter of 29 October 2004 (29.10.2004)
- ☒ the drawings:  
 pages \_\_\_\_\_ 1/2-2/2 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/EP 03/04899

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1 - 6	YES
	Claims		NO
Inventive step (IS)	Claims	1 - 6	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 - 6	YES
	Claims		NO

## 2. Citations and explanations

Reference is made to the following document:

D1: US-A-5 628 977 (HEISEL MICHAEL ET AL) 13 May 1997  
(1997-05-13)

1 The present application meets the requirements of PCT Article 33(1) because the subject matter of claims 1 to 6 is novel (PCT Article 33(2)) and involves an inventive step (PCT Article 33(3)).

Document D1 is considered the prior art closest to the subject matter of claim 1. Said document discloses a method for treating H<sub>2</sub>S-containing exhaust gases in a Claus plant (cf. figure 2 and column 6, lines 35 to 45), the gas being fed into a Claus boiler (12), sulphur and condensation (17) being separated off, the process gas being supplied to a single reaction furnace having a catalyst (23) and a working temperature of between 170 and 220 °C, the process gas leaving the reaction furnace then being cooled (25) and elementary sulphur being separated off by condensation (26). After precipitation of the condensed sulphur, the process gas is supplied to a post-combustion stage, washed (C) and fed back into the Claus boiler (12).

The subject matter of claim 1 **differs** from the known method in that the H<sub>2</sub>S-containing gas (coke oven gas) that is to be treated in the Claus plant is washed and regenerated first, and in that the process gas leaving the reaction oven is fed back into the gas washing stage upstream of the Claus boiler.

Returning the process gas that leaves the reaction oven with a residue of hydrogen sulphide to the gas washing stage upstream of the Claus boiler ensures that post-combustion of the process gas, as in D1, is not required (step B in figure 1) and means that the Claus plant can be simple in design, because the process gas can contain a residue of unreacted hydrogen sulphide, which is then captured in the gas washing stage.

Claims 2 to 6 are dependent on claim 1 and likewise meet the requirements of PCT Article 33(1).